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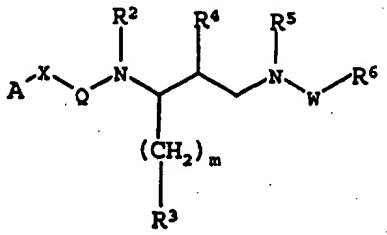

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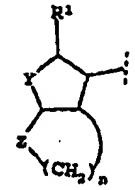

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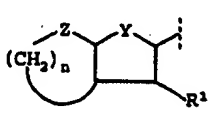

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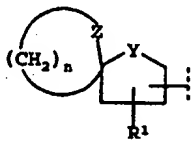

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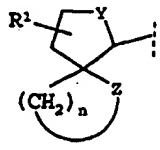

(D)

(57) Abstract

The present invention provides an assay for determining the biochemical fitness of a biochemical species in a mutant replicating biological entity relative to its predecessor. The present invention further provides a continuous fluorogenic assay for measuring the anti-HIV protease activity of protease inhibitor. The present invention also provides a method of administering a therapeutic compound that reduces the chances of the emergence of drug resistance in therapy. The present invention also provides a compound of formula (I) or a pharmaceutically acceptable salt, a prodrug, a composition, or an ester thereof, wherein A is a group of formulas (A), (B), (C) or (D); R^1, R^2, R^3, R^5 or R^6 is H, or an optionally substituted and/or heteroatom-bearing alkyl, alkenyl, alkynyl, or cyclic group; Y and/or Z are CH_2, O, S, SO, SO_2, amino, amides, carbamates, ureas, or thiocarbonyl derivatives thereof, optionally substituted with an alkyl, alkenyl, or alkynyl group; n is from 1 to 5; X is a bond, an optionally substituted methylene or ethylene, an amino, O or S; Q is C(O), C(S), or SO_2; m is from 0 to 6; R^4 is OH, =O (keto), NH_2, or alkylamino, including esters, amides, and salts thereof; and W is C(O), C(S), S(O), or SO_2. Optionally, R^5 and R^6, together with the N-W bond of formula (I), comprise a macrocyclic ring.